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CARTOGRAPHY ISSUE

PART I

ARCH C. GERLACH, Editor

Volume IV September, 1952 Number 5

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Because this Cartography issue was too large for standard binding, it will be issued in two parts. The November issue will contain articles on Academic Exhibits, Selected Recent Maps, additional announcements and other cartographic information, in addition to a summary of news received from Geographic Centers prior to October 15.

The Editor

CARTOGRAPHY PANEL - A.A.G.

The Cartography panel of the AAG was held on August 6 at 8 p.m. at the Hotel Statler. About 300 members were present and many were turned away by lack of seats. The subject of the panel was "Modern Techniques in Cartography" utilizing the exceptional opportunity of having some of the best experts in Washington available.

The papers given below were on a high technical level, but most useful for the geographer-cartographer to acquaint him with the possibilities of modern map production.

Erwin Raisz

MAP REPRODUCTION

Robert J. Lefebvre
Chief, State Service Office,
U.S.Government Printing Office

Maps can be reproduced by all the printing processes. The intaglio process, gravure, is presently the least used for maps because of the necessity for screening the entire plate, thus rendering small type matter rather illegible. Also, for short editions, the cost of preparing gravure plates is prohibitive. However, European countries are using gravure to a much wider extent than this country, and quality-wise, are surpassing anything produced by either the letterpress or lithographic process.

Letterpress is used on a small scale for reproducing maps, but it is being used more and more in Great Britain for this purpose. A special technique of wax engraving is used whereby the key plate is imprinted onto the wax mold, and type matter is impressed on the work manually, thus doing away with much of the photographic process. A ruling machine scribes the geographic features, contours, shore lines, etc. Electros are made from the wax moldings, one for each color.

Photo-lithography leads all other processes as the most practical method for reproducing maps. Usually only specialists engage in this method of map printing as it involves highly critical techniques and tolerances, beyond that required for conventional planography. Many would-be map reproducers have found this out to their chagrin and loss of profit. Unlike engravings, where the etchers have considerable latitude in making alterations and corrections, the lithographer has his hands tied with the negative his cameraman furnishes him. This means that copy preparation for photo-lithography is more critical than for any of the other processes. Unfortunately, the lithographer seldom has much control over copy preparation. In map work, it is cartographers who control this vital step. They either "make or break" the map, although shortcomings of the lithographer are not to be overlooked. The average lithographer has been rather slow in adopting new processes, even though they often mean saving in time and cost,or increased quality. On the other hand, some lithographers imagine themselves in control of intricate chemical reactions, when as a rule, this knowledge of chemistry could hardly help them differentiate between H_20 and "gin and tonic." Considerable research is being conducted by organizations such as LTF, Batelle, Army Engineers, etc., and there are many progressive plants eagerly taking advantage of the results of this research. Unfortunately, mainly due to expense, the research is

not long range enough, resolving itself to immediate problems.

To clarify the importance of good original copy, let me delve briefly into the technique of lithography for those of you who are not familiar with the process. There are two distinct photo-chemical steps involved, both of which unavoidably adversely affect quality to a certain extent. The first hurdle is the photographic process which produces a negative by reducing light-sensitive silver salts, in a film of gelatin, into metallic silver. This is done by suitable developers which attack those salts that have been light-struck. Next, the unexposed salts are later made soluble by means of hypo (fixer) and removed by washing. Obviously, in this intricate chemical reaction, detail will be lost by improper exposure, development, fixing; also, defects in lighting, film emulsion, the chemicals used, or, it can be the temperature fluctuations of the chemical solutions.

In spite of these hazards, the next photo-chemical process, that of platemaking, loses more definition than the photographic process. This is due mainly to bichromated colloidal sensitizer, which is far less sensitive than silver halide in gelatin. The platemaking process depends upon the insolubility of the light-hardened coating, and the removal of the unexposed water soluble portion of the coated surface. In the albumen process, exposure of a photographic negative produces a positive image on the bichromated albumen plate. This sensitive albumen when light-struck becomes water repellent and grease receptive, whereas in the unexposed area, the albumen is soluble and is washed out. Gum Arabic is used to make the non-image more grease repellent and water receptive. In the deep-etch process, a photographic positive makes a negative image on the bichromated gum or glue plate, thus creating a light-hardened stencil which, in turn, permits the image area to be deep-etched down to the metal with water-free alcohol and a strong acid etch. After the image has been made grease receptive with lacquer and developing ink, the protective colloidal stencil is removed by scrubbing with warm water and weak acid. Again, the plate is gummed so as to make the non-image area water receptive and thus, repel greasy ink on the press. Again, numerous difficulties can and do occur in platemaking, such as not having the proper pH, baume, coating thickness, exposure, temperature, etc. All these variably affect the quality of the final product.

Much research has been conducted in substituting synthetic chemicals such as polyvinyl alcohol and derivatives of cellulose for the conventional natural products; namely, gum arabic, albumen, and glue, which have been used for more than a century in lithography. Soya bean products are also arousing a great interest. A new plate coating called "Metalife" is claimed to revolutionize platemaking.

On the press, further deterioration of the image takes place, this time due to the transfer of the image to a rubber blanket, and then to paper. This transfer, or offset, cannot possibly reproduce the image

without some loss of fidelity. The resilience of the rubber, the uneven pressure of any or all of the cylinders, the tact of the ink, the lack of control of the dampening mechanism, the pH of the paper, etc., all can greatly affect the printed result.

The use of relief plates, more commonly known as "high etch" plates, might sometime in the future erase many of the chemical problems encountered in lithographic printing. Actually, the process amounts to letterpress printing on offset equipment. There are no water fountains to worry about, and very long runs are possible with dry offset plates. Dow Chemical is experimenting with magnesium, since this metal permits a finer halftone reproduction than zinc, and requires fewer etchings. What this means to the map maker is that even with the best of originals, one cannot expect more than a reasonable facsimile of what is given to the lithographer.

Time does not permit more than a superficial run-down of a few items that lead to better copy preparation. Since type seems to me to be the essential part of a map, as far as legibility is concerned, I think it is reasonable to concentrate on this item. The proper selection of the type, and its proving, is the key to good map preparation. Type size is more important than the style of the type. As long as the type is clean and well reproduced, the style is of little importance, except for aesthetic reasons. After all, the dot produced by a halftone screen is a lot smaller than the thinnest of serifs, and yet, the lithographer seems not to have much trouble reproducing these halftone dots.

The main difficulty with type is in the pulling of the proofs, particularly when using plastic. Quite often repro proofs which appear satisfactory to the naked eye will photograph poorly, due to unevenness, spreading of the ink, shallowness of the ink deposit, and reflection of the light, which causes a certain amount of irradiation throughout the thickness of the plastic. This holds true for drafted material or opaque areas, as well as paper pulls which, although more difficult for the cartographer to work with, actually produce better repros than on plastic. The use of the improved proof press, which prints in exact register on both sides of the plastic, has been of great help to the lithographer.

The use of the photo-composition machinery is an excellent method of handling type matter for maps. This can be illustrated by actual measurements showing that a silver image is nearly 1,000 times more opaque than an inked image. This type of machinery eliminates the need for expensive type proof presses, the use of the photographic camera for repros, and the negative engraving that is often necessary, due to customary faults in the repros. There are several photo-composing machines available: The Intertype Fotosetter, which operates identically to regular type-setting machines, except that a camera takes the place of the casting mechanism, and furnishes a strip of type on film or paper, is effective.

The ATF Hadigo, the Huebner Phototextype, the British Roto-photo, which operates on the order of a monotype, and the Higonnet-Moyroud, with which Dr. Vannevar Bush is connected, all have been tried and found practical.

Both type and photo-composition run into considerable expense, not only for the equipment, but the high salaries paid the operators. If some sacrifice of quality is deemed permissible in order to cut expense, then typewritten or cold composition might be a solution. Since the last war, great improvements have been made in this field of composition, such as the new IBM, and the Varitype, which are familiar to most of you. The Justowriter and the Fairchild Lithotype are recent newcomers, offering machines with a lot of possibilities, but good composition cannot be expected from untrained personnel. Quite often in the lithographic process the trouble and expense of extra work, caused by erasing errors or poor typewritten copy will offset any financial advantages in using cold composition over regular type set matter.

Direct lithography, or Autolithography, is an old process which is slowly coming back. For map work, drafting directly on a litho plate can be a money and time saver; however, the original is lost if the plate is spoiled on the press. Drafting and scribing on plastic and either exposing or transferring onto a sensitized plate saves the expensive photographic process. There are many new processes in the development stage which should be out in the near future. One of them permits drafting on a treated translucent plastic with a special ink which chemically affects the surface of the plastic. A light-opaque, water insoluble dye covers only the non-image area, thus creating a substitute photographic negative, as the drafting ink is soluble in warm water. Type can be imprinted with this same drafting ink, but in paste form. Excellent quality is claimed for the process.

In conclusion, no matter what process is used in the production of the original, the important criteria to follow is that the original must be of high quality because the lithographer has technical limitations which cause the loss of some of the fidelity. To do corrections is costly, as the lithographer is, in a way, a manufacturer who depends on mass production to keep his costs down, and any delay slows up his whole assembly line. Expressed in an equation, we have: Good originals equal good printing at less cost.

ON THE LETTERING OF MAPS

Charles E. Riddiford
National Geographic Society

With the superabundance of most everything today, in this machine age of ours, maps are no exception. It would be my guess that more maps are made each year now than were made in all history prior to the beginning of the present century.

Fine map-making is an art; it is also a science, and the one should compliment the other on equal terms. It is one thing to make an accurate and useful map, and quite another to make it presentable, attractive, pleasing to the eye. It is in this matter of appearance, dress, format, or whatever you like to call it, that the form of lettering plays such an important part.

The last fifty years have witnessed a great revival of craftsmanship in typography and fine printing, which in itself directs attention to lettering. This in turn has given birth to a considerable literature on these graphic arts, but I regret to say that it all relates to the printed book, maps being wholly neglected, as if maps were non-existant. It seems extraordinary that this should be so, in view of the mass production of maps, especially since the same critics who write on typography and printing are also likely to be among those who treasure old maps, certain of which are now being sought after for their decorative qualities, of which lettering is one.

Perhaps in order to have an aesthetic appreciation for the graphic art of a map, one must be born with it. I remember many years ago a friend of mine being handed a certain book to read. He opened it, took one look at the page, then handed it back. "No," he said, "can't read it, don't like the type." There are those, no doubt, who feel equally sensitive about the lettering of a map.

You will all agree that a map can be a thing of beauty, and thus come to mean more than its primary utilitarian end in itself. To the initiated, to those to the manner born, to the highbrow -- and I am sure you must all be highbrow or you wouldn't be here tonight -- merely to look at a map is a highly emotional experience.

The factual content of a map is generally taken for granted; it is the visual appearance, particularly on the first impression, to which lettering contributes so much, that sometimes determines whether a map is prized or discredited. This leads me to believe that the impact of line and form on our minds in everything we see has a greater influence on us than the more tangible facts of everyday life. An illustration of this is in the purchase of an automobile: more people are impressed with the visual, physical appearance of a motor car than

by what's inside it, and buy accordingly. It would seem then that a sense of beauty, apparently inherent in all of us, governs our daily lives to a greater extent than we suspect.

Calligraphy, Lettering, Type -- these are related terms. Calligraphy is the art of fine writing, and has been defined as freehand in which freedom is so nicely reconciled with order, that the eye is pleased to contemplate it. Lettering may be defined as a more formal development of calligraphy in that it is more or less done with the aid of rule, compass, or square. And type may simply be regarded as manufactured lettering.

Since it is the simplest and most direct way to make them, maps have always been hand-lettered, and some still are, five hundred years after the invention of movable type. To do this well requires a knowledge of the basic forms of letters, and when we understand these we have the key to lettering. Take the artist for example: to acquire the ability to draw a convincing life-like figure he studies anatomy. He soon sees the value of this when he comes to draw the nude figure next, and only after applying himself thus to a period of drawing from the nude will he be proficient to draw, finally, the clothed figure. So it is with lettering. Those who wish to go beyond the outline of an art must study its bones and its basic principles.

The lettering of maps in the past was moulded by the prevailing fashions in handwriting and type design, the tools used, add the mode of reproduction. From the latter part of the 15th century until well on in the 19th, the chief method of map reproduction was the engraving on copper plates. Before the introduction of copper, about 1480, wood blocks were used. By the middle of the 16th century copper had replaced wood, and for nearly two hundred years the lettering of maps was styled by the burin. Great delicacy and fineness of line, particularly in the serifs, is the chief characteristic of copper plate lettering, the natural result of the tool used; and such is the weight of tradition, cartographers still imitate it, which I think is a mistake. In my humble opinion it is out moded because there are other styles of lettering that are easier to read.

Maps of today are prepared mostly on paper for reproduction by photolithography, the names being type-set instead of hand-lettered, although I see the publisher of a recent popular atlas boasts of having carried on the great tradition -- without justice I might add. Hand-lettering is most suitable for sketch maps in books, and is attractive when the cartographer is also an artist, which he seldom is. But for formal maps the trend for many years has been to set the names in type.

Type faces, then, may be regarded as a branch of lettering, for making printing type is one of the many ways of making letters. But to select the proper type for a map calls for almost as much judgment as it does ability to design the type itself.

Letter designing is an exacting craft in which many factors enter. It is not only the form of each letter that has to be considered, but also the way the forms are combined and, in addition, it often varies with the different sizes of the same type face. The printing type available to cartographers in the early days of its use was limited in variety. In recent years, however, there has been great activity in the design of printing type, many new and exciting styles now appearing, some of them quite suitable for maps, if rightly applied.

There are two conditions on which the artist may be permitted to shape the alphabet. Whatever he does ought, in the first place, to make reading easier; and, in the second, to make writing satisfactory to the eye. Although legibility is of paramount importance, neither of these ends should be sought at the expense of the other. We may conclude, then, that lettering having Readability and Beauty will have all the virtues of good design. And the amazing thing about creative art is that it commands such an endless variety of expressive possibilities which do not affect the principle, yet are vitally important to the aesthetic result. Of the hundreds of type styles in existence there will be hundreds more, and hundreds more after that. Above all it is the lettering that gives a map Character, that all too elusive quality so difficult of achievement and in which so many maps are failing. The successful map will have unity and rhythm, which results from harmony between the various type styles chosen, and the best use of these in emphasis and contrast to win for the map a high degree of liveliness.

As far as I know, there are no types specifically designed for maps other than those used for the map publications of the National Geographic Society. In designing these, you may be interested to know that we considered the classic origins of our alphabet which, as every school boy learns -- and soon forgets -- is Roman. It was in the second century A.D. that the Roman letters reached perfection. Many fine letters were made then, but those usually considered the best appeared in the inscription at the foot of Trajan's Column in Rome. Those who are interested in the letter as a work of art go back to these for inspiration and enlightenment, as did Leonardo da Vinci and Dürer in their day, and Frederick Goudy and Eric Gill in ours.

The Romans did not distinguish between capital and small letters as we do, and how the latter evolved from the famous capitals is an interesting theory in itself. In the preparation of medieval texts, those masterpieces of the writing art, the scribes were in the habit of speeding up their labors with the reed or quill pen, and in doing so altered by degrees the shapes of the capital letters they commenced with. This development of a freely and quickly written small letter was a most important step in the evolution of our lower case alphabet.

I feel strongly that anyone who is called upon to design typography for today's maps, should certainly see in what measure the principles

that were the foundation of our alphabet can be revitalized, for the ever changing character of letters prevents the laying down of any binding rules for their construction.

The necessity of having any names on a map at all is to be regretted, for it cannot be denied that the legibility of the map itself is seriously interfered with by the names. Anyone who has seen a progressive proof of a fully colored map showing all but the names, must have been impressed with its singular beauty. Since a map would be of little use without names, herein lies the typographer's problem: how to impart character to lettering so small some of us need a magnifying glass in order to read it, and how to obtain the maximum in definition both for the map and the typography. The problem is a live one, a challenge to creative ability, and there is no end to what can be done. Life is in movement. When a thing is fixed it's dead. The types I have been privileged to design for National Geographic Society maps, for example, have been years in the making and the work is still going on, with improvements to existing styles and new ones being added, as inspiration prompts.

A map, then, can be a thing of beauty as well as utility, and good lettering constitutes the chief means to that end. It is not enough to possess the selective instinct alone for what is good, but what comes of study and experience is of equal importance. As Edward Johnston has admirably put it: "To choose or construct beautiful forms requires good taste, and that in its turn requires cultivation, which comes from the observation of beautiful forms. Those who are not accustomed to seeing beautiful things are, in consequence, often uncertain whether they think a thing beautiful or not. Some -- perhaps all of us -- have an intuition for what is beautiful; but most of us have to achieve beauty by taking pains."

MAP SCRIBING ON PLASTIC SHEETS VERSUS INK DRAFTING

Samuel G. Sachs
U.S. Coast and Geodetic Survey

Engraving of maps on copper began several centuries ago, and for many years was the only means of map reproduction. Although other methods are available today, copper engraving, despite its slow production and high cost, is still used in many countries, partly because of its fine quality, and partly because map producers, are not sufficiently informed to utilize other methods.

Copper engraving has, however, been superseded to a large extent by a rather conventional, standardized approach to the problem of preparing map manuscripts for reproduction. This usually consists of photographing the compilation or field sheet and using the negative to print blue line images on plastic sheets or on drawing paper mounted on metal. Each of the colors to be shown on the printed map is smooth-drawn with ink on a separate sheet. Sometimes bluelines are not made, the inking being done on a transparent plastic sheet which overlays the manuscript. In both methods, the separation drawings are then photographed and the negatives, after retouching, are used for exposing to the press plate.

The procedure of applying revisions to the negatives was developed less than fifty years ago. This eliminated the necessity of making the changes on the drawings and rephotographing, or of doing the work on the press plate; both methods resulting in a deterioration of quality. In the improved method, the undesired detail was blocked out on the negative, by painting over the area, the new information was added by engraving with a steel point through the photographic emulsion. In this manner it was possible to duplicate in appearance the unaffected portions of the negative. The negative was similarly revised for years, a new printing plate being processed each time. It possessed the same quality as the first plate since negative does not deteriorate.

During the years 1940 to 1943 this engraving method was greatly advanced at the U.S. Coast and Geodetic Survey by the invention of scribing tools, which broke away from the use of tools borrowed from the copper engraving and lithographic fields. The new gravers were a concept which utilized the advantages peculiar to glass, and resulted in a considerable impetus, to the art of engraving maps on glass. By 1946 experiments had been made and certain parts of maps were engraved on plastic sheets which had been prepared with a scribing coating; the plastic then being used to process directly the press plate. Plastic scribing remained dormant from that time until the past year or so,

although the glass engraving method was being adopted in a number of European and South American countries.

Recently there has been an effort to adapt the glass scribing technique to the more convenient plastic sheet. While the technique is basically the same, some slight modifications are essential. At present there are a half-dozen or more map producers who have not only tested the procedure but are in early production scribing the color separations on plastic sheets instead of drafting with ink or engraving on copper.

The advantage of scribing consists of obtaining a quality superior to copper engraving at a speed more rapid than ink drafting. Costs are further decreased because no photography or negative retouching of the separations is required. The drawings themselves are the negatives used for preparing the printing plate. As with the inked drawing method a negative is made from the manuscript and one blue-line processed for each color; but instead of being a blue-line image on paper, it is on a plastic sheet, upon which has been placed a scribing coating.

When the draftsman is inking, much of his effort while following the line, is exerted in obtaining a uniform line and making it a dense black to ensure suitable photographic copy. When the draftsman is scribing his entire effort is directed toward following the line, because the tools themselves provide for the uniformity and density of line. He has no difficulty with the flow of ink or roughness of paper. The tools enable the scribing draftsman to attain a microscopic standard in thickness of lines and width of roads, by using pre-sharpened engraving blades which are quickly interchanged. Erasures are simple too. By merely covering the area with paint one has an unimpaired surface to scribe.

One appealing feature for map organizations pressed for skilled personnel, is the element of a much shorter training period for beginners. As for the experienced ink draftsman, he will quickly become a better scriber. The conversion is so rapid he can put forth productive material the very first day, and with some practice will thereafter prefer the scribing method.

The coated plastics have sufficient transparency to be placed over each other for engraving subsequent colors, and for checking interference or registration. Precise register can thus be achieved. If so desired, bluelines need not be made, as the plastic sheet may be placed over the transparent compilation and directly engraved. Photographic-stripper lettering is applied to the scribed plastic or to a separate sheet. In the latter method the sheet is double printed, with the line work on the press plate. When the separation plastics have been scribed, these negative drawings are ready for plate-making in the same way that negatives are photographically made from inked separations.

A few illustrations of the tools mentioned may be helpful in understanding the principles of scribing.

Slide No. 1 shows the swivel graver, designed to simplify the operation of drawing the curved double lines often used to represent roads. Auxiliary uses are the scribing of single lines of slight curvature and lines of unusual width. A set of blades is pre-sharpened to conform to established standards. The correct engraving blade is selected, inserted in the holder, and is immediately ready for use.

Slide No. 2 shows the rigid graver which is intended for single lines of a uniform thickness, such as contours, railroads, and grid lines. A set of pre-sharpened points, varying in line weight from .002 to .017 of an inch in .005 of an inch steps, are kept in a numbered block ready for use. These needles are sharpened by placing the graver on a fine oil-stone and slowly flattening the point until the desired line thickness is reached. Pre-sharpened points over .005 of an inch will last indefinitely.

Slide No. 3 shows the fine line graver which is used for the finest lines, such as fine contour lines, .003 of an inch or less. The fine line graver often makes it possible to scribe a uniform line in any direction for a five hundred percent greater distance before lifting the tool, than with inking or copper engraving. Contours are engraved in twenty-five percent of the time otherwise required. The fine line points are highly polished sewing needle tips which are not re-sharpened; being inexpensive and easily replaced they are discarded after several hours.

These three tools are the basic instruments for scribing. Other tools, which are less frequently used, do perform important functions and are indicative of the mechanization possible in a hereto indivualistic endeavor.

One such device is the dual sub-divider and building graver illustrated in slide No. 4. As a sub-divider it engraves at regular intervals short parallel lines of a uniform thickness and length, with a means of varying the length of any stroke. In this manner the projection lines of aeronautical charts are rapidly marked off into seconds of latitude and longitude. As a building symbol graver, the scribing point is changed to one which is the desired building width, and by controlling the length of the stroke a perfect square is produced with a single motion.

The fifth slide shows a mechanical graver which was designed for scribing symbols and letters. These are normally stuck-up, but there are times when it is advantageous to deviate. The instrument is a pantographic device, utilizing templates to engrave the characters. There is a means of raising and lowering the scriber with the right hand, as it moves the stylus from groove to groove of the templates which are easily assembled and locked into position.

The last slide illustrates the electric dot graver which scribes the dots for depth curves on nautical charts, and for reservation boundaries and transmission lines on topographic maps. The verticle shaft, revolving continuously at a low speed, is depressed with the forefinger at the proper intervals, causing the chisel-edged point to make contact

with the negative, thereby engraving the dot. A set of pre-sharpened gravers in sizes ranging from .005 to .017 of an inch is available. A small motor and flexible cable furnish the power.

Progress in the design of scribing tools is continuing. From Sweden we have news of new models of the sub-divider and swivel gravers.In the United States new types of building and swivel gravers are being developed. Scribing tools and pre-coated plastic sheets are now commercially available; for a small sum it is possible to obtain everything necessary in the scribing method.

Being familiar with the scribing technique not only by virtue of close association with its development during the past ten years, but as originator of the scribing tools shown, it is my belief that the current activity by the various map producers is the beginning of a new era in which there will be a wide acceptance of the scribing method as the ideal system for the preparation and reproduction of maps.

EVOLUTION OF PAPER AND PLASTICS AS RELATED TO MAPPING

Lynn R. Wickland
Army Map Service

Paper has been defined as a matted or felted sheet of vegetable fibers formed on a screen from a water suspension. These vegetable fibers are composed of what is technically known as cellulose.

Until the middle of the 19th century, most paper was made from cellulose obtained from rags, old rope, textile waste, and straw. Today, wood is a leading source of pulp for paper making. The change took place around 1854, when a new paper-making fiber was brought to the United States from England. Known as soda pulp, it was essentially wood pulp, so cooked in chemicals as to eliminate the less desirable elements of the wood pulp. It was the first of the three chemical pulps in wide-spread use today. Groundwood pulp, made mechanically from wood, was developed shortly thereafter. The first sulphite pulps were made in the United States in 1867, but not until the late eighteen eighties were they sufficiently perfected to make much commercial headway. Sulphate or kraft pulp was developed early in the 20th century.

Groundwood papers are not permanent nor as suitable for fine printing as the rag papers used in past centuries. However, the commercial progress of printing demanded a paper better in quality than the groundwood and less costly than the rag papers. The chemical pulp sheets, soda, sulphite, and sulphate, developed within the last century, and the various finishing and coating processes evolved with them, have supplied the answer to this demand.

The fiber of many different kinds of plant vegetation can be made into pulp and paper. In general, the plants thus used may be divided into three major classes; seed hair fibers such as cotton; wood fibers; and stem or bast fibers, such as flax, hemp, jute, etc.

The kinds of pulp now available vary in their suitability for the manufacture of paper for different purposes. For instance, cotton rags or cuttings are used in the manufacture of Rag Paper. Cotton hull fibers which are short fibers are removed from the seed and can be used in high grade papers. Wood pulp is used in the manufacture of bond or writing paper, ledger, book kraft, letterpress and offset printing papers and others, while stem or bast fibers are used in the manufacture of more rugged paper used for such articles as flour bags, cement sacks, etc.

The paper generally used in the cartographic drafting of maps is a 2-ply Bristol, cross grained. This paper has a hard finish quite similar to a calendar finish and is arrived at partially through hand pro-

cessing. Through this process the paper is carefully chosen and two plies are laminated together to give a cross grained effect. The grain of one layer of the paper is at right angles with the grain of the other layer. The necessity of cross graining paper is very important from the dimensional stability standpoint. Single ply papers were tried and found to be fairly stable in one direction while varying greatly in the other. Then came the present paper which has much better dimensional stability in both directions. A 3-ply paper has been tried but the third layer makes it more expensive and adds nothing to the quality of the paper. Although this paper is the most stable, dimensionally, of all those tried, unmounted it does change considerably during processing. In fact changes up to 0.15" in 30" have been observed but when this paper is mounted to a rigid base, such as sheet aluminum, it is quite stable. A blue line imagé is then processed onto the paper and then the drafting is accomplished.

High Wet-Strength Paper

Concerning paper used in the production of military maps, it was determined early in World War II that maps printed on ordinary rag, sulphite or other lithographic papers were not durable enough to withstand the rough treatment given them by troops in the field. A new, stronger and more stable paper sheet had to be developed. The Corps of Engineers through the Army Map Service proceeded to have a paper manufactured, by selected paper companies, embodying a resin. This resin was called "Melamine" and by including it in the formula, a sheet of paper was developed having many more desirable characteristics than the papers previously used. This paper had much better opacity, tear, fold, wet rub and dimensional stability characteristics than any other paper in its class. Not only did the paper have the desirable characteristics already described but it was a fairly bright, white sheet. Usually the whiter the sheet of paper the weaker the tensile strength however, with the addition of Melamine Resin the paper manufacturers could bleach the wood pulp sufficiently with chemicals without affecting too much the tensile strength. This paper was used all during the war and is still being used by the Army in the production of most military maps.

Plastics

To continue with resins and plastics Leo Bakeland, an American of Belgian origin, was probably the first to produce a synthetic resin with marketable possibilities. This took place in 1909 although the first synthetic resins were produced in 1869. The resin produced in 1909 was made from phenol and formaldehyde and given the name Bakelite. Resins are for the most part organic amorphous solids or semi-solids

that are usually characterized by a typical luster; they are often transparent or translucent. Natural resins are principally of vegetable origin and occur as exudates from pine or fir trees, either alone or as mixtures with turpentine or other essential oil (oleoresins). Examples of such resins are rosin (colophony), copal, damar and sandarac. A common resin of non-vegetable origin is shellac, a substance secreted by the lac insect. The major uses of shellac are in fabricating finishings compositions, varnishes, low-grade soaps, paints, inks and linoleums. The synthetic resins made available as the result of modern research are not only used as substitutes for natural ones but have found much wider application. The terms resin and plastic are to a certain extent used interchangeably. The chief distinguishing component, sometimes the only component, of a plastic is a synthetic resinous material. The resin is the material before processing and the plastic is the material after processing. A plastic is usually a substance of much higher molecular weight than a resin. Typical plastics on heating become soft enough to be formed under pressure without melting, while resins on heating give relatively low-viscosity melts. The differentiation is resinoid at room temperature and plastic above 65°C. or 149°F.

Some of the more common types of resins used in the manufacture of plastics are, melamine, polyethylene, vinyl, phenolformaldehyde, ureaformaldehyde, alkyd, phenolic and acrylic and of course many others. Due to the fact that melamine and vinyl resins are the ones used most commonly in map papers and plastic for relief maps respectively, I will confine my remarks to those more specifically.

Melamine Resins

Melamine resins such as the one used in high wet-strength map paper are synthetic resins of the theremosetting type which means that once they are molded their shape cannot be changed by heating and applying pressure. These resins are the product resulting from the chemical reaction of melamine and formaldehyde. It should be kept in mind, as we refer to phenol resins, urea resins, and melamine resins, that formaldehyde is one of the raw materials used in making these resins. Cured melamine resins are brittle and not adhesive; therefore, they are sometimes combined with more elastic, film-forming compositions, usually alkyd resins, depending upon the intended use. Alkyd resins are formed by the condensation of certain acids or anhydrides with various alcohols (alcohol + acid = alkyd). The alkyd resins are used primarily as coating materials. By varying the acid and alcohol thermoplastic and thermosetting alkyd resins a wide variety of types can be prepared.

Vinyl Resins

Of the resins previously mentioned, the one used in the manufacture of vinylite, is of course a vinyl resin. I wish to point out that the term "vinylite" is a trade name and the term vinyl is a chemical term. The term vinyl used alone does not mean some material substance; for instance, no chemist has a bottle of it along with his other chemicals. This term is really a prefix which tells us what kind of chloride or acid we are working with, or for that matter any other vinyl compound. A vinyl sheet is a semi-rigid sheet of plastic which can be re-formed.

Vinyl plastics are used generally in the production of relief maps for the Army. This vinyl plastic is a thermoplastic which can be heated and molded into relief very simply. After the map information is printed on the vinyl sheet, the maps are registered over a male mold made of plaster. Small holes are drilled in the valley floors of the plaster mold to allow suction to be applied after heating the plastic from above to sufficiently soften it. Models are formed in this manner in a matter of seconds.

The information which I have given you concerning paper and plastics is just a small portion of facts concerning the two fields. Anyone desiring further information on these subjects may refer to "Organic Chemistry" unabridged by Fieser and Fieser, 7th Production Year Book or many of the trade magazines

After the papers and the question period the working committee held open session where future plans were discussed. It was suggested that the contact with photogrammetry, map psychology, map build-up and composition should be explored.

THE UNIVERSAL TRANSVERSE MERCATOR GRID AND PROJECTION

John A. O'Keefe
Army Map Service

Background

The well-known English cartographer, A. R. Hinks, prefaced the 1911 edition of his book on map projection with the remark that it was really not necessary to go very deeply into the theory of map projections; and in particular, that the theory of conformal projections had been somewhat over-elaborated. In the 1920's he issued a new edition, in the preface of which he drew attention to the significance of conformal projections in military cartography.

The event which caused him to change his mind was the development of military survey as an adjunct to artillery. Since World War I, artillery has tended to rely increasingly on maps and survey in place of adjustment by observation. In World War II, more than half of the fire of corps artillery was unobserved. As the significance of unobserved fire increased, the outlines of the principal problems began to stand out. It soon appeared that while the gunner could take the target location with sufficient accuracy from the map, and even, without very serious loss of accuracy, his own position, there was another element which he could not take from the map. This was the direction of north at the guns. That is to say, even though the gunner might be able to determine, within a minute of arc, that the bridge upon which he was firing was at an azimuth of 235°18', and at a range of 6,595 yards, he could still not point his gun at the target until he had a reference direction from which to turn off the angle of 235°18'.

For this purpose the map could not be used, because guns are ordinarily so placed that they cannot be seen; and consequently their view is restricted. This is fatal because the azimuth measured off a map from two points which are not far apart is not an accurate azimuth. On the other hand most of the larger guns and howitzers are capable, at their best ranges, of an accuracy in deflection of 1 to 1 1/2 minutes of arc--in artillery language, 1/3 to 1/2 mil. For example, the firing tables give a probable error of six yards in deflection at 18,000 yards for the 155 mm. rifle -- the famous Long Tom. Artillery, therefore, practically never uses a map for orientation.

For emergencies, reliance is sometimes placed on the magnetic compass. This is not satisfactory, however, since the compass is subject to errors due to the magnetic declination. These errors vary from place to place, so that a very detailed map of the magnetic anomalies is re-

quired to hold the error due to this source below about 15' of arc. Again even if the mean declination at a point is known, there is a daily variation of several minutes of arc.

The artillery has therefore been compelled to make use of survey data. Attempts have been made to obtain orientation from astronomic observations; but for example for five days after D-day, the sky was cloudy. In the main, reliance must be placed on the triangulation data of the area. Thus, the practice has grown up of preparing what are known as trig lists -- the lists of the control points of an area, arranged according to the sheets of the local large-scale map. For instance, for each sheet of the famous 1:80,000 series of France, the French during World War I prepared a list of from 30 to 200 points which had been surveyed in the area.

Coordinates

The points given in the trig lists are always given by their x, y coordinates on some rectangular system, rather than by their latitudes and longitudes. There are two reasons for this -- a highbrow and a lowbrow reason. The lowbrow reason is that it is much easier to train an inexperienced or partly experienced man to survey in x, y coordinates than to teach him to survey in latitudes and longitudes. The highbrow reason is that a locally Cartesian coordinate system which maintains the Christoffel 3-index symbols at very small values, avoids many formal difficulties in the mathematics which do not correspond to any genuine need, and have a purely parasitic role. Latitudes and longitudes, on the other hand, are chiefly advantageous for the same purpose as certain building regulations -- namely as a trap for the amateur.

Projections and Coordinate Systems

Evidently it is not possible to cover the whole earth with squares all of the same size. Though the price of a good golf ball has gone from 65 cents to a dollar, the golf ball manufacturers have still not been able to cover the ball with a square grid; and in fact they have quit trying. If somebody should succeed, he would have a way of making the perfect, distortion-free map projection; all he would need to do would be to spread out his rectangular coordinate system on squared paper, and the job would be done. So we can be peetty sure that nobody will ever find a way to cover the earth with a perfect grid.

To cover the earth with an imperfect grid can be done by reversing the usual procedures of Cartography. Suppose we have made a map of, say, the United States. On this map we can mark a set of perfect squares. Now, if we transfer the squares in imagination from the map to the earth, we shall have a set of imperfect squares, whose distor-

tions on the earth will be the reverse of the distortions of the map with which we started. Such is the theory of grid coordinates.

Of course, the map need never be actually constructed. It need only be imagined mathematically. In fact, the usual method of constructing a map is to begin with an x, y coordinate system which will form a perfect Cartesian net on the plane surface of the paper; and to calculate the x, y coordinates of critical points, such as meridians and parallels in x, y coordinates. To put the grid on the map, then, it is not necessary to make any special effort; it is only necessary not to pull down the scaffolding from which the map was built.

Fire-Control and Survey on the Grid

The fire-control officer uses the grid in two ways. For relatively short-range fire -- say a 105 gun -- he makes use of a prepared chart, called a firing chart, on a relatively stable medium, which carries the grid. To this chart he transfers map detail, according to the grid coordinates on the map; and on this he plots the data found from survey, including his own location. By transferring data from the map to the chart, he reduces the effect of the paper distortion which has occurred since the map was printed, including the effects of humidity, stretching, wearing, tearing, and folding. On the chart he then measures off the range and deflection to the target. Notice that he has assumed that in this area there are no local distortions of the grid. Theoretically, he could correct for them; but in practice he doesn't have time.

The procedure for long-range weapons is the numerical equivalent of this graphical procedure. Starting with the numerical values of the coordinates of gun and target, the fire-control officer calculates the range and the grid azimuth to the target from the simple formulae:

$$\text{Tangent of the azimuth} = (\text{difference in } x) \div (\text{difference in } y) \quad (1)$$

$$\text{Range} = \text{square root of } (\text{difference in } x, \text{squared}) + (\text{difference in } y, \text{squared}) \quad (2)$$

Like the graphical methods, the formulae are only as good as the assumption that the grid is perfect.

Specifications of an Artillery Grid

We are now at the heart of the problem. What imperfections can we tolerate in the grid (for the sake of more coverage with a single grid) without interfering with the artillery? Let us examine the Long Tom firing tables again. We see that at 12,000 yards, the probable error in deflection is four yards; but the probable error in range is 68 yards.

Evidently if the map data supplied to the gunner is in error by as much as 1 in 3,000 in deflection, it will be noticeably bad; but the range data may be wrong by as much as 1 part in 200 without exceeding the intrinsic errors of the gun. Evidently, then, we should choose a projection whose angular errors are very small, even if we have to make serious sacrifices in the distance accuracy. This, of course, calls for a conformal projection. It is the reason why Hinks had to reverse himself.

There is another important reason for the use of conformal projections. It is the requirements of the artillery surveyors. These men are required to carry the control from the trig list point to the gun. The techniques which are most used in battle are triangulation, intersection, and resection, which are all techniques involving angles principally. Traverse is too slow; and is not needed in the cleared lands of Europe and Asia. Consequently, the artillery surveyor much prefers a conformal grid, in which the correction to the lengths (which he doesn't measure) are large. So he too needs a conformal projection.

These two arguments have been felt as decisive. In 1914, most of the countries of the world were using non-conformal projections for mapping -- the Bonne projection in France, the Cassini-Soldner in England and parts of Germany, and the Polyconic in America. The Latin countries for the most part used the Bonne (like France), the Teutonic countries used the Soldner (like Germany). These projections, which had hitherto been used only for the construction of the map, suddenly appeared on the face of the map as artillery survey came into its own. The French cartographers immediately saw that a conformal projection would be superior, but it was not until 1916 that the ponderous machinery of the General Staff came around to this view; and by this time, the grid had so entrenched itself as the language of the military establishment for all designations of points, that there was an enormous problem in transferring all intelligence data, all maps, trig lists and unit positions from one grid to the other. By the end of the War, however, the French had adopted the Lambert conformal conic over the whole of the Western Front. The Germans shifted to the conformal transverse Mercator about 1920; the British to the transverse Mercator about 1935.

During World War II, the only important non-conformal grid still in use was the American polyconic. Fortunately, it was never necessary to fight a major battle either in the United States or in any of the other areas to which the grid was applied.

At the end of the war, Europe and Africa had been plastered with an array of military grids, Allied and enemy, of all shapes, sizes, and projections. America was covered, in theory, by maps and trig lists on a nice neat set of polyconic zones, based, however, on an obsolete grid whoee angular errors in places were eight times as great as the probable errors of the guns as quoted in the Firing Tables.

The Geodetic Branch, Intelligence Division, O.C.E., proposed to replace the whole system by a regular progression of transverse Mercator belts, based on the north-south belts of the International Map of the World. It would be rather difficult to imagine any other logical basis for a world-wide set of belts. The projection had to be conformal, for the reasons stated before. This reduces us in practice to choosing between the Lambert, the transverse Mercator, and the Stereographic. The Stereographic can be excluded at once, since it cannot be extended indefinitely in either direction, and hence the number of separate Stereographic grids required to cover the earth would run to four or five hundred. The Lambert must also be excluded, for somewhat the same reason. Theoretically, a Lambert grid can be extended all the way around the earth; practically the gradually increasing difference between y-north and true north limits the Lambert in temperate latitudes to something like 40° of longitude. The minimum number of Lambert grids required to cover the whole earth cannot be fixed exactly; but it is of the order of several hundred. On the other hand, it is possible to cover the whole earth from 80°N. to 80°S. with 60 transverse Mercator zones. This minimizes the evil effects of zone junctions, without sacrifice of accuracy.

As for the width of the zones, it is evident that this is controlled by the growth of the scale factor. Some howitzers have an accuracy of one part in 500 in range; evidently the scale factor should not much exceed one in 1,000. The battery surveyors usually expect an accuracy of about one in 1,000 in their work; hence in Europe where the most violent battles are usually fought, an accuracy of 1:2,500 is sought. These two objectives are attained by a choice of 6° belts, with a reduction on the central meridian of one part in 2,500. Having chosen 6° belts, it is logical to make these coincide with the belts of the International Map of the World, because most large-scale map sheets are nowadays thought of as subdivisions of the 1;1,000,000 I.M.W., and hence the grid junctions will fall at the boundaries of the sheets.

The Germans and Russians had adopted this more or less self-evident scheme, for the same reasons; and consequently there was a considerable bulk of material already available in eastern Europe in these terms. This material had been captured by United States forces during the War, and was thus available at little expense.

These, then, were the considerations which led to the adoption of the UTM. Since its inception, it has been understood as an international project. The NATO countries have participated in the planning; and it has been adopted as the NATO grid for certain portions of Europe. At the same time, it is rapidly superseding the polyconic grid on the maps of the United States. In the Far East, it is being employed in Korea and Japanese Home Islands. Its use in other areas is being actively discussed.

During the Korean war, the whole system has proved its worth. The artillery has been able by the use of survey, to mass its fire; and to fire without any warning. This ability has resulted from survey; and the survey in turn was based on the thousands of Korean triangulation stations which were captured from the Japanese, calculated in UTM coordinates put up in trig lists, and distributed shortly after the outbreak of the war.

EMPLOYMENT OUTLOOK FOR EARTH SCIENTISTS

Demand for earth scientists is rising as a result of the defense program, according to the U.S. Department of Labor's Bureau of Labor Statistics. Geologists and geophysicists are needed to help provide more petroleum and minerals; meteorologists, to furnish additional weather data for military air force operations; geographers, to supply information on foreign countries important in defense planning; and oceanographers, to carry on research relating, for example, to submarine operations and amphibious landings.

These and other defense-connected and peacetime needs are described in the Bureau of Labor Statistics Bulletin No. 1050 on "The Employment Outlook for Earth Scientists." It includes information on the nature of the work done in the major earth science specialties, training requirements, places of employment, and earnings, in addition to a discussion of employment trends and outlook. The report is available from the Superintendent of Documents, Washington 25, D.C. for 30 cents.

Shortages of experienced geographers developed by early 1951 in the Army Map Service and in other units of the Department of Defense carrying on intelligence research. Geographers most in demand are those with specialized knowledge of certain foreign areas which can be applied to international relations, international trade, the technical assistance program for underdeveloped areas, and military planning, and those who have the requisite experience for cartographic work, intelligence, and logistics. Demand for geographers in government service is expected to decline if defense activities slacken.

Although colleges and universities ordinarily employ about three-fourths of the geographers, demand there will likely be limited in the next few years to replacements. However, beginning in the late 1950's, when there will be a sharp increase in the college-age population, geographers will find expanding teaching opportunities.

REVIEWS

Sir Clinton Lewis and J.D.Campbell, Editors, The American Oxford Atlas, Oxford University Press, New York, 1951. $10.

The editors bring a wealth of knowledge and experience to the compilation of this new atlas of the world. It contains 120 pages of maps (15 1/4" x 10 1/4"), and a 100 page gazetteer. All the maps were prepared and printed in England, but with a keen eye for the American market, one of the editors, Mr. Bickmore, spent considerable time in the United States popularizing this atlas. The relief maps are printed in six colors, producing twelve layer tints which are not separated by contour lines. Five new projections have been devised for use in the atlas. The sixteen special maps show population, precipitation, vegetation, etc. The lettering is exceptionally clear, and the paper and binding are of high quality.

Some errors and omissions have been made. In the selection of railway patterns some of the latest data have been overlooked. For example, the important railroad west of Denver, Colorado, through the Moffatt Tunnel is not indicated, while the narrow gauge line from Salida, Colorado, south to Santa Fe, which has been abandoned and removed, is shown (plates A17 and A19). In several places the land tone covers a body of water; Lake Okeechobee (plate A15), and Saginaw Bay (plate A13), are conspicuous examples of this. No plate showing ocean currents appears in the atlas; such a map would have added considerably to the value of the work.

In spite of minor blemishes this is one of the best world atlases in its price range.

Norman J.W.Thrower

Leon E. Seltzer, Editor, The Columbia-Lippincott Gazetteer of the World, 2148 pp. Columbia University Press, New York, 1952.

In 1855 J.B.Lippincott & Company published a gazetteer which contained almost 100,000 listings. The preface states that: "Recently increased facilities for travel and the unexampled extensions of commercial relations, which within a few years have been established between the remotest portions of the globe, give at the present time an extraordinary interest and importance to everything relating to the science of Geography." This famous reference work was revised in 1866 and in 1905. Although several printings of the last edition were made, it has been out of print for many years.

The quotation from the preface is even more appropriate today than when it was made almost a century ago. The realization of this fact encouraged the Columbia Lippincott Press to initiate in 1946, in cooperation with Lippincott, a new gazetteer of the world. Six years

were required to assemble this monumental work of more than five million words, 130,000 articles, and 160,000 listings. The result is the most comprehensive listing of places in the English language.

There are articles on countries, regions, provinces, states, counties, cities, towns, islands, lakes, mountains, deserts, seas, rivers, canals, dams, peninsulas, capes, etc. The articles give more than the facts of location. They provide information about pronunciation, variant spelling, population, altitude, trade, industry, agriculture, mineral resources, irrigation works, communications, history, cultural institutions and other pertinent facts.

From the first entry A, a fishing village in Norway, to the last for Zywiec, a town in Poland, clear and concise statements describe the places of the world. There are entries for such recent places as Oak Ridge and Burnt Creek Camp. One may discover that Menam is the popular name for the Chao Phraya River, that the power plant at Fushan is fed coal dust, or that the Coromandel Coast is a name derived from the Cholas, a sea going dynasty of the fourth to eleventh centuries.

This is a scholarly reference work; one that is destined to become authoritative. It does not take the place of an atlas. It complements an atlas and should be used with one. Whereas the price of fifty dollars is prohibitive to most individuals, the volume is essential to every geographical library. The geographer will find the volume useful both as a dictionary and as an encyclopedia.

Edward B. Espenshade, Jr.

Karl-Otto Gassdorf and M. Langhans, Kriegsfolgen-Karte Westdeutschland 1939-1950, Frankfurt a.M.

This large 1:500,000 map of Germany portrays the most burning question of postwar Germany - the war damage, which has to be rebuilt. An octagon or a circle is proportionate in area to the population of each city. Percentage of destroyed, rebuilt, and new buildings, number of plants, demontage, etc. is shown by symbols, blue if increased and red if decreased since 1939. An accompanying booklet gives the figures. The percentage of refugees is also given for each area.

One fact stands out from the map: that large, industrial cities are damaged far more than smaller cities, except for places of actual land warfare. Würzburg 75 percent; Kassel 66 percent; Dortmund 66 percent; Cologne 64 percent; Koblenz 63 percent; Hamburg 54 percent; Jülich near Cologne was 97 percent destroyed, but surprisingly West Berlin registers only 22 percent destroyed. Very little has been rebuilt, Karlsruhe for instance, is seven percent reconstructed and four percent newly rebuilt, which is a little better than average. Almost all large cities lost some population while the small cities

gained. Cologne for instance went from 768,000 to 575,000; Hamburg from 1,712,000 to 1,578,000 but Heidelberg grew from 86,000 to 120,000. The amount of postwar demontage of plants, through which they lost a considerable amount of their capacity, is amazingly large. Demolished bridges are shown in an inset; most of them have been repaired.

This monument to the horrors of war is clear, well drawn, and shows that one thing the war did not damage was the ability of German cartographers.

Erwin Raisz

David Greenhood, Down to Earth: Mapping for Everybody, 262 pp. Holiday House, New York, revised edition, 1951.

This is a new edition of the original volume issued in 1944. The revisions which pertain to about ten pages incorporate some of the principal developments and changes in cartographic practices and agencies since the first printing.

This is not a textbook; it is designed to be read rather than studied. It was prepared to give the amateur an understanding and appreciation of maps whether he is a user, maker, or collector. Nevertheless the volume covers most of the material essential to a cartography textbook and presents it in a clear and simple style. Individual steps in orienting a map, making a compass traverse, or drafting a map are spelled out in sufficient detail to be done without further instruction or guidance. The three parts are entitled: (1) Getting the Most Out of Maps, (2) Making Your Own, (3) Forming a Collection.

The relative ignorance and lack of interest of the American public concerning maps and cartography is unfortunate. This volume should help to correct these weaknesses. It performs a function for which there is no other similar volume. Geographers should encourage their friends who are interested in geography to read this book. The artistry of illustration reflects the hand of Ralph Graeter.

Edward B. Espenshade, Jr.

Eduard Imhof, Gelände und Karte, Eugene Rentsch Verlag, Erlenbach-Zurich, 1950.

Professor Imhof teaches at the Polytechnicum of Zurich. Although privately published, the book was prepared for the army but recommended also for teaching and for men of the outdoors. This reviewer regards it as one of the most outstanding books of its kind.

The main theme of the book is, as the title suggests, that the map derives from a picture of a piece of land and is not an abstract diagram Very appropriately Imhof starts out with field sketching. He appears to be an artist of great ability; his style reminds us of William Morris Davis, but made livelier by shading.

Next he analyzes the problems of maps: scales, grids, projections, relief problems, which he compares with photographs of relief models. Generalization is shown by photographing 1:100,000, 1:50,000, etc. maps up to 1:10,000. His diagram of city symbols for various scales is particularly clever. Lettering, geographic names, and composition are handled in a condensed way, as the book is more for the map-user than for the map maker.

There is a remarkable set of old maps of Switzerland showing that the first map of that country by K. Trust in 1495 attempted to show landforms and forest, and in F.W.Delkeskamp's bird's-eye-view-map it reached perfection. Surveying, map-reading, a description of Swiss topo maps, field orientation, and military problems take up the rest of the book; all are excellently illustrated.

Some interesting facts: if you hold a pencil at arm 's length and look at it with one and then with the other eye, the difference is ten percent; three fingers at arm's length do the same (Swiss must have wider fingers than I have). Much is written on the graduated binocular which can be used not only for angles but also for distances. The 'piece de resistance' is the set of color plates consisting of a magnificent set of anaglyphs of air photos, relief methods and examples of Swiss maps. One can only envy that country for their color engraving. The book is a happy combination of German thoroughness with Swiss artistry, the chief attributes of a good cartographer. We only hope that something comparable will appear on the American market.

Erwin Raisz

Printing Review: Special Cartographic Number, 40 pp. Printing Review Ltd., London, Vol. 16, No. 57, Winter 1951-52.

This special issue of the British magazine Printing Review is marked by a cover map made from the new Oxford Atlas. It contains six short articles pertaining to maps of which two refer to the Oxford Atlas. Two other articles discuss the British military map needs and the progress in map reproduction. An article entitled the "Brunswick Map Printers" would be of interest to those who are baffled by the mysteries of offset printing. The printing of maps in several colors using wall tiles, oleomargarine for ink and jello for gum is described. With only this equipment on hand in a German prison camp the men managed to produce several maps to help in escaping.

The issue itself is an excellent sample of printing and whereas it is designed for the printing profession, it is of great interest to cartographers.

Edward B. Espenshade, Jr.

Glossary of Cartographic Terms, Army Map Service, Technical Manual No. 28, 1948, pp. 95, mimeographed.

Manual of Physiographic Terms, No.205979, Map Distribution Division, Army Map Service, pp. 26.

These useful manuals serve to fill a longfelt need in American cartography. The Glossary of Cartographic Terms is much concerned with terms of air-photo compilation and planographic map reproduction. One learns such expressions as "templet ratiograph" - a device for determining the ratio in decimals between two distances; a "sawbuck" is an x symbol for spot elevations; and a "Mock up" is a style sheet.

The Manual of Physiographic Terms was apparently written for people perfectly innocent of any training in physiography. Even those may not get much excited by such definitions as "Ant Hills" are "Piles of sand and organic material built by ants." On the other hand such terms as permafrost or polygonization are explained. One of the most useful features of the Manual is three imaginary landscapes in three colors showing almost all of the feauures of the glossary. Although the drawings are not signed the handiwork of Professor Lobeck is unmistakable.

Erwin Raisz

Decisions on The Names in China. U.S. Board on Geographic Names, 1952.

This booklet is of major importance. Most names are respelled according to the Wade-Giles system with syllables hyphenated and "'" marks. For instance Tzitzihar is now Ch'i-ch'i-ha-arh. Pei-p'ing and Ch'ung-ch'ing are now spellings of these capital cities but the conventional spelling is allowed. Aqso became A-k'o-su and so on.

The motive of this radical change was probably the necessity for the Chinese syllabic characters. The Wade-Giles system would serve for remote villages for which the Chinese Postal Guide would be of no help. The map-maker, however, is confronted with the task to sell this spelling to the public. Hyphenation and "'" marks take extra space. The National Geographic Society and the press and magazines do not use hyphenation and "'" marks as they do not mean anything except to Chinese scholars. It would be desirable that practical cartographers would be represented at the Board to avoid a widening split between governmental and private spelling.

Erwin Raisz

Kartographische Nachrichten, Mitteilungen der Deutschen Gesellschaft für Kartographie E.V.

After the foundation of the Deutsche Gesellschaft für Kartographie on July 9, 1950 as a successor to the former Deutsche Kartographische Gesellschaft, a sort of Newsletter has been edited for the approxim ately

400 members of the Society; Nos. 1 and 2, 1951, by H.P.Kosack, and No.3 by W.Pillewizer, München, Leopoldstr. 175. It is published at ir. regular intervals and is primarily devoted to activities of the society, giving lists of membership etc. Besides cartographic news it includes new discoveries, changing place names, boundaries and railways. Especially interesting is a statement on the state of development of the sample sheets of the new German topographical map at 1:100,000. A new cut of the single sheet is proposed, which will cover 24 minutes latitude and 40 minutes longitude. This would mean that the maps at 1:100,000, 1:50,000 and 1:25,000 will be the same size. Sixteen sheets of the latter will be equivalent to one sheet 1:100,000 and there will be 90 full 1:100,000 sheets to one of the 1:1,000,000 maps.

Canada Descriptive Atlas. Department of Citizenship and Immigration, Ottawa. 8 x 11". 120 p., 1951.

This atlas sells for one dollar and is apparently designed for education of new citizens. It serves also as a school atlas, reference book a is useful even at the university level. There is a map of each province with no relief shown. A large part of the Atlas is devoted to text and many well selected halftones. Considerable care went into the production of this work. Perhaps the addition of some more general maps showing geographic regions, relief, climate, and population, would hav made the atlas more useful but even without them one is richly rewarde if he sends his dollar to Ottawa.

Erwin Raisz

NEW PUBLICATIONS

LIBRARY OF CONGRESS CLASSIFICATION, CLASS G.

A revised edition of the Library of Congress Classification, Class G went to press at the Government Printing Office in June. It includes schemes for the classification of atlases and maps. The map classification is an expansion and revision of the "Preliminary Draft" issued in 1946, with a major change in the notation for Africa and Australia. The atlas classification is completely new in its regional breakdown, which is designed to agree in arrangement with the map classification. Microfilm of the map and atlas sections may now be purchased directly from the Photoduplication Service, Library of Congress, but the printed volume will be available from the Superintendent of Documents sometime in 1953.

THE ROYAL INSTITUTE OF INTERNATIONAL AFFAIRS

The Institute is presenting a series of short factual studies of certain of the Latin American Republics, designed to provide up-to-date information on the political, economic and social situation in each country.

CHILE: An Outline of its Geography, Economics and Politics, by Gilbert J. Butland, 128 pp., 7 maps, bibliography, November, 1951, $2.50.

URUGUAY: South America's First Welfare State by George Pendle, 100 pp., 2 maps, bibliography, April, 1952, $2.50.

Both titles obtainable from the Royal Institute of International Affairs, 542 Fifth Avenue, New York 36, New York.

THE ECOLOGICAL SOCIETY OF AMERICA

Copies of the Glacial Border Symposium are available at cost, 40¢, from Murray F. Buell, Secretary of the Ecological Society of America, Rutgers University, New Brunswick, New Jersey. This symposium includes: "Vegetation and Cryoplanation" H.M.Raup, "Pleistocene Frost Action near the Border of the Wisconsin Drift in Pennsylvania" C.S. Denny, "The Fossil Record near the Glacial Border" J.E.Potzger, "The Possible Role of Microclimate" John N. Wolfe, "Distribution of Ohio Animals" Edward S. Thomas, "Plant Distribution in Relation to the Glacial Boundary" E. Lucy Braun.

BIBLIOGRAPHY OF MAPS & GEOGRAPHICAL PUBLICATIONS ON CENTRAL EUROPE

Berichte zur deutschen Landeskunde, edited by the Amt für Landeskunde, Remagen, Germany, is again available to subscribers at 10 marks per volume. Each volume consists of two issues published three months apart, and two complete volumes are published each year. The first issue of each volume lists all books and papers relating to the geography of Central European areas, and the second issue

lists all maps, both separately published and included in books and papers. Vol. I was published in 1941. The post-war publication began with Vol. V in 1947 and Vol. XI appeared in the first half of 1952.

Bibliographie Cartographique Internationale 1949

Publiée sous les auspices du Comité National français de Géographie et de l'Union Géographique Internationale avec le concours de l'UNESCO par M . Foncin and P. Sommer. Paris, Armand Colin, 1952. 380 p.

Compiled with the collaboration of map librarians and curators in fifteen countries. Entries for United States were contributed by The Library of Congress.

Catalog of Copyright Entries, Maps and Atlases. July-December, 1951. Washington, Copyright Office, [1951]. (Third series, vol. 5, pt. 6, no. 2)

Hood, Peter. About Maps. Harmondsworth, Middlesex, England, Penguin Books Ltd., 1950. (Puffin Picture Book 67) 2/-d. Cover title, 31 p.

A very attractive primer on the purpose of maps and plans and how to read them. Illustrations are taken from Ordnance Survey maps and historic maps in the British Museum. Very suitable for junior high school.

International Hydrographic Bureau. Monaco.

Glossary of Cartographic Terms and Manual of Symbols and Abbreviations used on the latest navigational charts of the various countries. 3rd Edition. November, 1951. (Special publication No. 22) 42 x 33 cm. xvi, [174p]

Also in French, Double columns, French and English side by side. In addition to numerous terms [in various languages] and symbols in table form, there are lists of approximate equivalents in Roman characters of Greek and Russian letters used in the Glossary and Abbreviations of foreign terms used on national charts. Separate alphabetical indexes of French and English terms conclude the work.

PERSONAL NEWS

ACKERMAN, EDWARD A. was awarded the AAG Citation for Meritorious Contribution in the field of Geography for his contribution to public policy in the field of water and its utilization.

ALEXANDER, JOHN, University of Wisconsin, has prepared a series of economic base studies of Oshkosh and Madison, Wisconsin, which are being published respectively by the Bureau of Community Development and the Bureau of Business Research of the University of Wisconsin.

BLACK, LLOYD D. Foreign Service Institute, Department of State, was awarded the AAG Citation for Meritorious Contribution in the field of Geography for contributing, through meticulous and time-consuming effort, a detailed reorganization and consolidation of the fiscal procedures of the Association, resulting in greatly improved fiscal and budgetary control.

FLANNERY, JAMES, who has been teaching at the University of Kansas, has been at the University of Missouri during the summer, and is now taking up his new duties on the staff of the Pennsylvania State College.

JENKS, GEORGE F, University of Kansas, was awarded the AAG Citation for Meritorious Contribution in the field of Geography for his conception and execution of an economic atlas of Kansas, designed to meet the needs of State officials.

LeGEAR, Mrs. CLARA E., Map Division, The Library of Congress, received a Citation for Meritorious Contribution in the Field of Geography for the compilation of United States Atlases, a bibliography of some 3,600 U.S. atlases in The Library of Congress up to 1950. The Citation was made at the joint banquet of the AAG and the NCGT on August 7. Mrs. LeGear is now editing a union catalog of an additional 2,500-3,000 atlases pertaining to the United States, which are not in the Library of Congress but have been reported by 167 co-operating libraries.

MARTIN, ROBERT L. Middle Tennessee State College, has been recalled to active duty by the Navy. He is assigned to the Cadet Training Program, U.S. Naval Air Station, Pensacola, Florida, as Aerologist.

RAISZ; ERWIN will be at the University of Virginia during the Fall term. His office remains at 107 Washington Avenue, Cambridge 40, Massachusetts, for sending out landform maps. North Africa has recently been published ($1.00).

RECKORD, GORDON, Executive Secretary of the Mutual Security Agency, was keynote speaker at a recent session of the University of Wisconsin summer Institute for Social Studies, stressed the world responsibility for American citizens today. The building of a military shield in Western Europe is under way and in the long pull ahead, two of the toughest problems facing us are the threat of insolvency in

Great Britain and its sterling area and the pervasive sense of insecurity in Continental Western Europe. He pointed to two special brands of financial trouble as the "dollar crisis" as far as London is concerned and the "sterling crisis" as those in this country call it, and how every two years since the war there has been a sharp drop in gold and dollar reserves.

Delving into the problems facing us in continental Europe, he considered the economic reasons for the unification of Europe as the creation of a "single market," essential if production in Europe is to be rapidly increased by widening the home market, taking advantage of mass production, and thus increasing the productivity of labor.

Primary dangers in using American strength to organize and lead the free world, he revealed as: (1) The danger that we will treat our partners like satellites because they are economically less strong than we; (2) The danger that we will regard the whole mutual security effort as a highly temporary enterprise. In reference to our treatment of allies, he called the Soviet Union's inability to deal with any country except on a relationship of master to servant, "the Achilles heel in the Kremlin's drive to conquer the world."

ROBINSON, ARTHUR, University of Wisconsin, has completed a series of essays on cartographic design. They will be published under the title of The Look of Maps, now in galley proof at the University of Wisconsin Press and should be out in the fall. His text, Elements of Cartography, to be published by John Wiley and Son, goes into galley shortly.

WINSLOW, DAVID C., on leave from the Oklahome A & M College, has been placed in charge of writing the new geography textbooks under the Air Force ROTC program. He is Chairman of the World Political Geography and Related Subjects Panel, Curriculum Planning Group, AF ROTC at Air University, Maxwell Air Force Base, Alabama. Last month his new AF ROTC Instructors Guides for Air Science I (World Political Geography) were sent to the 188 college and university units for use this fall.

NEWS FROM GEOGRAPHIC CENTERS

THE NATIONAL ARCHIVES

Washington 25, D.C. The National Archives has published a Preliminary Inventory of the Cartographic Records of the Federal Housing Administration. This 57 page inventory describes 373 groups of administrative, statistical and city maps prepared by the FHA, 1934-42, to guide the development of housing and the creation of a sound mortgage market in the United States. It is National Archives Publication No.53-1.

The National Archives has on exhibit, July 27-September 20, more than 150 manuscript or annotated maps from its record holdings, illustrating "Geographical Exploration and Topographic Mapping by the United States Government" during the past 175 years. Maps of geographical exploration were selected to illustrate both the scope of Government explorations and the wealth of information recorded about climate, demography, vegetation, soil, physiography, natural resources, transportation facilities, land use and other items of interest to the historical geographer in reconstructing the successive landscapes of the regions explored. The section of exhibit devoted to topographic mapping is divided into five main periods of development. This is National Archives Publication No. 53-2.

Copies of both publications may be obtained without charge from the Exhibits and Publications Section of the National Archives and Records Service, General Services Administration, Washington 25, D.C.

BRIARCLIFF JUNIOR COLLEGE

Briarcliff Manor, New York. A cartography major for women of Freshman and Sophomore college age was introduced into the Briarcliff curriculum in 1951 under the sponsorship and general advisory supervision of the U.S. Army Map Service. Briarcliff's "Cartographic Techniques" is at present the only course of its kind in any two-year college in the United States. This cartography major is open to a limited number of students each year.

CENTRO DE ACTIVIDADES GEOGRAFICAS, COLOMBIA

Apartado Nacional 2104, Bogotá, Colombia, S.A. This center was founded March 27, 1951, with the primary objective of studying the geographical aspects of the country and of promoting research to bring about a better understanding of the country. Those responsible for organizing this "Center" were General Julio Londoño (President), Dr. José Ignacio Ruiz (Vice-President), Dr. Luis Duque Gómez (Secretary), Dr. Enrique Uribe White, Dr. Roberto Restrepo, Dr. Belisario Arjona, Professor Ernesto Guhl, and Dr. Javier Pulgar Vidal. The "Center" now has more than twenty members, all distinguished by their publica-

tions and study in geography or closely related fields.

The "Center" proposes to collect in a single volume a number of studies on the Pacific coast of Colombia. These will include "Constitución Geológica de la Zona" by Padre Jesus Emelio Ramírez, "Morfologia del Clima y del Territorio" by General Julius Londoño and Professor Ernesto Guhl "Zonas de Vegetación" by Julio César Cubillos, "El Clima y la Biologia" by Dr. Laurentino Muñoz, "Aspectos Patológicos de las Poblaciones que Viven en la Zona del Pacifico" by Dr. José Concha y Venegas, "Aspectos Etnográficos" by Lic. Roberto Pineda, "La Magia entre los Indigenas del Choco" by Lic. Milciades Chaves, and "Aspectos Socio-económicos de la Zona" by Dr. Eduardo Acevedo Latorce.

UNIVERSITY OF ILLINOIS

Urbana, Illinois. Twenty-four persons representing six federal agencies, two state research groups, three public libraries, and twelve universities attended the Map Workshop at the University of Illinois from June 9 through June 25, 1952. The Workshop, offering special non-credit training courses for persons interested in map librarianship, was sponsored by the Library School through the Division of University Extension. Bill M. Woods, Map Librarian and Instructor in Library Science, who also offers in the Library School a credit course on Maps and Cartobibliographical Aids, directed the Workshop.

Sessions included lectures, laboratory periods, and discussions on every phase of map librarianship. Because backgrounds of the participants varied, (geography, geology, history, library science, social sciences), it was necessary to assume no particular knowledge of maps or library methods.

Problems of cartography, map and aerial photograph reading, and cartographic terms were discussed by R.L.Carmin of the Geography Department. Map history, map activity including map depository programs, societies etc., and map resources of libraries concluded the first part of the Workshop.

The second unit, and one of particular importance due to the lack of a comprehensive bibliography of maps took nearly a week. It included general and special bibliographies, books on map making and map reading, catalogs, indexes, maps of governments at all levels, of societies and of commercial publishers, catalogs of old and rare map dealers, periodicals useful for mapping information, atlases, gazatteers, and other miscellaneous aids as guide books, travel folders, etc.

Information on map mounting and repair by Mrs. Ethel Richbark of the Mending Section of the Library introduced the unit on Technical Processing of Maps. General principles of cataloging and classification were given by Marian Harman, Acting Catalog Librarian. Further discussion included map cataloging and classification, processing of

the AMS maps, preparation of the index map, subject and area headings, old map cataloging, and the processing of aerial photographs, pamphlets and folders.

Final sessions were devoted to ways to promote the use of maps and to a general review emphasizing the essential materials of a map collection and the responsibilities of the map librarian. Several other staff members of the Library, the Library School, and the Department of English and members of the Workshop assisted with sessions.

INDIANA UNIVERSITY

Bloomington, Indiana. The extra-curricula program of the Geography Department has been unusually full this year. Successful efforts have been made to interest allied departments in the offerings of Geography by bringing in speakers who would have broad appeal. In the fall of 1951 Chauncy D. Harris (Chicago) spoke on "The Economic Resources of the Soviet Union", and Clarence Batschelet, who visited Bloomington in connection with the westward movement of the center of United States population, discussed some problems in using census data. A symposium on the Soviet Union, conducted jointly with the Department of Government, attracted wide attention and caused a second joint symposium to be conducted during the Spring Semester on "United States Foreign Policy - East or West". During 1952 three members of the faculty presented progress reports on their research. The highlight of the Spring Semester was a display of maps in the University Bookstore during the first half of May. In conjunction with this exhibition Arch C.Gerlach of the Library of Congress lectured on "The Map Collection of The Library of Congress" and H.C.Darby of University College, London, spoke on "The Evolution of the British Landscape".

The following students have been appointed graduate assistants in the Department of Geography for the academic year 1952-53: Robert C. Mayfield (Texas Christian University); Bernard Prud'hom me (University of Montreal; University of Grenoble); Samuel Ortaggio (Western Michigan College); Louis DeVorsey (New Jersey State Teachers College); George Hess (Western Reserve University). Champ Clark Carney and James W. Taylor were reappointed.

Norman J.G.Pounds' title was changed from Visiting Professor to Professor of Geography. Professor Pounds is spending the summer on research in Europe.

Professor and Mrs. Stephen S. Visher toured the West and southwest Canada during July. Mrs. Visher taught a course in Conservation at the State College, Bozeman, Montana.

THE JOHNS HOPKINS UNIVERSITY

Baltimore 18, Maryland. Douglas H.K.Lee visited India in June under arrangements between the Government of India and the Food and Agricultural Organization of the United Nations, to report on proposals for

the establishment of a Laboratory of Animal Climatology at the Indian Veterinary Research Institute, Izatnagar, U.P. He subsequently spent five weeks in the field at Yuma, Arizona, studying the effects of solar radiation upon human performance under desert conditions. The Mobile Climatic Laboratory recently completed by The Johns Hopkins University for the Quartermaster Corps was used in this work, which was czrried out in conjunction with the Climatic Research Laboratory and the Environmental Protection Branch of the Research and Development Division, QMC.

Robert L. Pendleton will return in February 1953 from three years in Siam where he has been serving with the Special Technical and Economic Mission for Thailand, of the Economic Cooperative Administration. He has been in charge of the fertilizer experimental program for rice, with experiments in about forty localities, in most of the important rice growing regions of the Kingdom of Thailand. h e has travelled extensively, visiting Ceylon, Malaya, Goa, Indonesia, etc. He plans to write a book on Siam, with full references to other tropical areas so well known to him.

During the spring, Dr. Sirri Erinc of Istanbul, Turkey, was a visitor and cooperated with Dr. Carter in his continuing studies of the Pleistocene terraces with their associated soils, in an attempt to gain time perspective on the difficult period between glacial times and the present.

THE UNIVERSITY OF KANSAS

Lawrence, Kansas. Reorganization and expansion of courses in cartography coincide with the inauguration of the Ph.D. program in geography at Kansas. New courses have been developed to give training more closely in line with needs as shown by the survey of commercial and governmental map agencies conducted by George F. Jenks on a 1951-52 Ford Foundation grant. Five regular courses and additional seminar work are open to geography students wishing to emphasize cartography. An additional course meets the specific needs of students in other fields interested in developing some competence in cartography. In September the cartography laboratory moved into larger quarters to accommodate equipment purchased in recent months and to meet the space requirements of the expanded teaching and research program.

Thomas R. Smith continues to offer courses in map intelligence and to direct the procurement of maps for the University collection. During the last two years emphasis has been placed on the purchase of carefully selected foreign maps.

George F. Jenks' Atlas of Kansas, for which he was awarded a citation at the last AAG annual meeting, was the most important cartographic publication from the department during the year. Graduate students prepared numerous maps for articles on population change in western Kansas by Professors Jenks and Kollmorgen, published in recent issues of the Kansas Academy of Science Bulletin. A. William Küchler has

completed compilation of a new map of vegetation of the United States for publication in Goode's Atlas, is working on a bibliography of vegetation maps, and continues his project on detailed vegetation mapping of Mount Desert Island, Maine. He has also been appointed to the commission on small scale vegetation mapping of the International Botanical Congress.

RUTGERS UNIVERSITY

New Brunswick, New Jersey. Guido Weigend, acting chairman, received a grant from the Office of Naval Research to do one year of field work in southwest France on the problem of inter-relationships between ports and their hinterlands. Mrs. Weigend and he will leave soon after the IGU Congress and return late in August, 1953. In his place the University has appointed David Blumenstock as Lecturer and Acting Chairman for the year and perhaps longer.

John Brush has been promoted from Lecturer to Assistant Professor. He is collaborating on a textbook of Asia and is developing the Geography of New Jersey.

Iven Bennett has been reappointed as Instructor.

UNIVERSITY OF WASHINGTON

Seattle, Washington. During the past quarter twenty-seven graduate students were in residence: eleven post-Ma ster's and sixteen post-Bachelor's degrees. There were also forty-eight undergraduate majors in residence. Appointments to teaching fellowships, 1952-53 included:
Francis Anderson, Western Reserve and University of Washington
James Brooks, Central Washington College and University of Washington
Dennis Durden, Georgia Institute of Technology
William Erwin, Oregon State College
Niel Field, University of Toronto
John Gierhart, University of Oregon and Syracuse University
Burton Kelso, University of Toronto
Donald Patten, University of Washington
Francis Shafer, Oregon State College
Joseph Simms, Southern Illinois University
Rodney Steiner, University of California, Los Angeles
Herbert Voigt, University of Washington.

UNIVERSITY OF WISCONSIN

Madison, Wisconsin. Plans for the next academic year involve several temporary changes in staff. Henry Sterling will be on leave to serve as project leader in a ten-month interdisciplinary research program in the Venezuelan Andes, from September 1952 through June 1953. The project is sponsored by the Consejo de Bienestar Rural (Rural Welfare Council), a philanthropic organization administered and financed jointly by the Venezuelan government and the American International

Association for Economic and Social Development, of New York. The main objectives of the program will be (a) to make a comprehensive diagnosis of the region's economic and social problems, and (b) to recommend a balanced program of remedial action designed to improve the economy and rural living standards of the area. The field team also includes American specialists in anthropology, rural sociology, and agricultural economics, who will be assisted by several advanced graduate students from this country and by Venezuelan specialists in agronomy, animal husbandry and soils. Two-thirds of the full-time personnel of the team will be from the University of Wisconsin. Richard Hartshorne will be on leave during the fall semester to collaborate with Llewellyn Pfankuchen, Professor of Political Science, in writing a book on international relations. Arthur Robinson will serve as department chairman during Mr. Hartshorne's absence. Carl Troll of the University of Bonn, Germany, will be with the department during the second semester as Carl Schurz Memorial Professor.

During the summer Robert Finley conducted a two-week, 2,000 mile field trip course on the Geography of Wisconsin. Edwin Hammond taught at the University of Minnesota. Glenn Trewartha, Kirk Stone, and Clarence Olmstead continued research respectively on world population, Alaska, and North American orchard and vineyard regions.

Field trips received special attention during the spring semester. The graduate field course spent the entire spring vacation in the peninsular Calhoun County area between the Illinois and Mississippi Rivers. The consultation of John Morrison, who resides in the area, was greatly appreciated. Reconnaissance study was carried on while going to and from the area through Illinois, eastern Iowa and southern Wisconsin. The advanced air photo interpretation class used as a regular Saturday laboratory the Cross Plains region, lying on the margin of the driftless area west of Madison. They compared photos with reality for such features as geology, surface configuration, drainage, soils, climatic evidence, vegetation, crops, transportation and population changes. The class in the geography of manufacturing spent a full day observing the structure and workings of the Illinois Central Railway and Chicago Transit Authority in the Chicago area. Robert Finley, of the Extension Division, cooperated with the State Aeronautics Commission and the State Historical Society during June in conducting aerial field trips of the Madison-Wisconsin Dells region. The elementary physical geography class made its usual trip to Devil's Lake by special train.

Masters degrees were awarded during the year to Edwin E. Boughton, now assistant manager of the Zone and Market Area Research Department of the Audit Bureau of Circulation, Chicago; Jerry B. Culver and Robert T. Johnsrud, each employed at The Library of Congress in Washington during the summer; Robert E. Durland, who has been teaching at Wisconsin State College, Whitewater, during the year; Harvey G.

Miller, now with the Military Intelligence Section of the Far East Command in Tokyo; Delmar C. Multhauf of Hartford, Wisconsin; Philip Muntz who will work on the Venezuela project during the summer; and Frans J. Snacken who will return to the Geological Institute, University of Ghent, Belgium (from which institution he holds the Ph.D. degree) after an extended trip through eastern Canada and attendance at the Geographical Congress meetings in New England and Washington.

The following people passed Ph.D. preliminary examinations during the spring: S.E.Brown, who is engaged in field study in the Wyoming Valley, Pennsylvania; Donald K. Doherty of the Geographical Branch, Department of Mines and Technical Surveys, Ottawa; Albert L.Farley who has been appointed Geographer in the Department of Lands, Victoria, British Columbia; Paul E. Lydolph who has accepted a position at Los Angeles State College; Robert Polk who has been awarded a University Fellowship to continue his study next year; and William H. Wallace, now teaching at Auckland University College, New Zealand.

Graduate students who will be aided by fellowships or scholarships this year include: Robert Polk, University Fellowship; Erol Tumertekin of Turkey, Earl Brown, add Reginald Marshall, Whitbeck Fellowships; Gordon Lewthwaite of New Zealand, Knapp Fellowship; Miriam Kerndt, Tripp Scholarship; and Robert Johnsrud, Alvin L. Long, and Tom McKnight, University Scholarships.

The Wisconsin Council of Geography Teachers met at the University for its annual spring meeting. In a program arranged by George Winsor, Andrew Clark presented a paper on the historical geography of Prince Edward Island. The urban field trip was led by John Alexander. George Winsor was elected President for the 1952-53 year.

A.A.G. COUNCIL MEETINGS
AUGUST 6, 1952

At the Council Meeting, held at the Hotel Statler, Washington, D.C., August 6, 1952, the following actions were taken:

1. The report of the Placement Committee was accepted. Robert Wrigley and Robert Scott were appointed to the Committee, and the resignation of Urban Linehan was accepted with regret.

2. The report of the Publications Committee was accepted, and the recommendations made by the Committee regarding publication in The Annals of memoirs of deceased members were approved.

3. The report of the Honors Committee, recommending two types of recognition: (1)"The Association of American Geographers Award for Outstanding Achievement"; (2) "The Association of American Geographers Citation for Meritorious Contribution to the Field of Geography" was accepted. The following persons recommended by the Committee for citation for Meritorious Contribution in the Field of Geography were approved Edward A. Ackerman, Lloyd D. Black, George F. Jenks, Clara E. LeGear.

4. By-Laws presented by the Southeastern Division were approved.

5. It was moved and carried that a committee be established to study the Regional Divisions, and review the Constitutions and/or By-Laws by which the Divisions operate and make recommendations to the Council and the Divisions.

6. The Treasurer's report was appooved, and the account to which the contribution to the IGU is to be postedwas left to the Treasurer's discretion. The Treasurer was authorized to make minor budgetary adjustments, provided the total budget allocation is not changed.

7. The Secretary's report was approved for presentation to the Business meeting, August 7.

8. Continuation of the Executive Committee of the Council until January 1, 1953 was approved.

9. The report of the Committee on International Fellowships was accepted and the President and Secretary were authorized to appoint two members to replace Guido Weigand and Robert Campbell.

10. The report of the Committee on Geographers in National Defense was accepted, and Paul Siple was asked to continue as Chairman.

11. The Chairman of the Committee on Research Grants reported on the Council's request that a statement on the status of available funds be published.

12. Jan O.M.Broek was appointed Chairman of a Committee to deal with the Air Force ROTC course in Political Geography, the Committee to be appointed by the Chairman.

13. The Executive Committee, in consultation with Preston E. James and Clarence Jones, will appoint a committee to carry out a suggestion that the United States participate in the preparation of a series of monographs on the Geography of the United States. This is part of a project, "The Geography of the Americas" sponsored by the Third Pan American Consultation on Geography.

14. After considerable discussion of the proposed constitutional revisions, a motion was made that a document prepared by the Secretary, which included proposals submitted to the Council with two petitions be distributed to the membership. The Secretary was instructed to notify the signatories of one of the petitions, that distribution of the document would be delayed by thirty days to enable them to amend their petition if they so desired.

15. A motion was passed recommending a change in the wording of Article IV, Section 1, so that the terms of office of the national officers coincide with the date of the annual meeting.

16. A motion was passed recommending the amendment of Article IV, Section 2, thereby making it mandatory for the Nominating Committee to submit a slate of candidates to the Secretary at least three months prior to the next annual meeting of the Association, and the Secretary to immediately notify the membership of these nominations. Additional nominations may be made in writing by any ten members if received by the Secretary at least sixty days prior to the announced date of the Annual Meeting. At least thirty days before the Annual Meeting the Secretary shall mail to all members official ballots to be returned within ten days. The Council shall be empowered to fill vacancies until the next election.

17. The Secretary was requested to ask the Committee on Executive Office to present a report to the next meeting of the Council.

ANNUAL BUSINESS MEETING

The Annual Business Meeting was called to order by retiring President Preston E. James at 2 p.m., August 7, 1952.

A motion that the agenda as published be adopted was carried.

Meredith Burrill, Secretary General of the Third Consultation on Geography of the Pan American Institute of Geography and History, reported on the results of the consultation. A two-year work program has been planned dealing with colonization, resource development, geography teaching, and a series of volumes on the Geography of the Americas.

The Secretary's report was presented and nominations for committee membership invited.

Establishment of a Committee to study the Regional Divisions was announced, and the President reported that he had visited several Divisions.

A request was made that copies of the report from the Committee on Careers in Geography be made available for distribution to undergraduate geography majors.

The effort of the Placement Committee to expand its scope of activity was mentioned.

It was suggested that the sources of funds for foreign grants and fellowships be published in The Professional Geographer.

The Vice-President presented his report and pointed out that a map was now available in the Central Office on which clear demarkation of Divisional boundaries had been made, and that during his term of office he had had the pleasure of welcoming two new Divisions, the New York-Metropolitan Division and the Pacific Coast Division.

The Treasurer's report was presented and a vote of thanks recorded for his success in coordinating and reorganizing the financial affairs of the Association.

The report of the Honors Committee was presented, as reported in minutes of the Council Meeting of August 6, and it was reported that the four award winners would be announced at the forthcoming banquet.

Richard Hall was elected to the Credentials Committee to replace Mabel Eads whose term of office expired January 1, 1952.

Edward Espenshade, Edward Ullman and John K. Wright were elected to the Honors Committee.

A motion endorsing the action of the Council in electing the 1952 Nominating Committee by mail vote was carried.

A report from the Committee on Plans for the Fiftieth Anniversary Meeting recommended a summer meeting at a National Park or aboard a steamer on the Great Lakes, the program to center around a theme of (1) A look into the past, (2) Geography today, (3) A look into the future.

A report on the past and prospective action of the AAG and other geographers with regard to the Air ROTC course on Political Geography, revealed that the status of this course is to be discussed at a meeting in September at Maxwell Field. Preston James and Jan Broek are to attend. It was recommended that any questions and suggestions be addressed to Jan Broek and not sent individually to Air Force officials.

A report on a Colgate University Committee on the impact of ROTC on the university curriculum was presented.

A motion was carried reaffirming the Association's action in 1948 regarding cooperation of department heads in withholding the announcement of Assistants, Scholars and Fellows until April 1, and notifying each appointee that he has until April 15 to accept.

Copies of the Secretary's report, the Treasurer's report, and minutes of the Business Meeting, may be obtained upon request from the Central Office, Map Division, The Library of Congress, Washington 25, D.C.

PRELIMINARY LIST OF A.A.G. MEMBERS WITH SPECIAL INTERESTS IN CARTOGRAPHY

Any members who wish to have their names added to or deleted from this list are urged to notify Professor Erwin Raisz, Virginia Geographical Institute, University of Virginia, Charlottesville, Va. Current addresses may be obtained from the Directory Issue (May, 1952) or the directory supplement section of this issue.

Adkinson, Burton W.
Aho, Hilia
Albertson, Mary
Almquist, John R.
Alpert, Leo
Anderson, Dorothy M.
Applebaum, William
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DIRECTORY SUPPLEMENT

The following listings are in two sections. The first includes address changes and corrections for data published in the May 1952 issue. The second is a supplement of new Members and Associate Members who joined the Association since the last Directory went to press.

Address changes will be published regularly in each future issue of The Professional Geographer. All members are, therefore, urged to keep the Central Office informed of their address changes.

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